

A New White-spotted Subspecies of *Eumeces chinensis* (Scincidae: Lacertilia) from Lutao Island, Taiwan

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Abstract: A new subspecies, *Eumeces chinensis leucostictus* is described from Lutao, a small island east of Taiwan. This form differs from the other subspecies in a unique white-spotted dorsal pattern in juveniles and in a combination of several meristic characters.

Key words: *Eumeces chinensis leucostictus*; Lutao; Taiwan; Taxonomy; Scincidae

In 1986 H. Ota collected a series of specimens of *Eumeces* from Lutao Island, Taiwan. From this island *Eumeces c. chinensis* has been reported by Okada (1939). After examining these specimens, however, this form proved to be clearly distinct from *E. c. chinensis* and other known subspecies and species from East Asia in juvenile color pattern. The juveniles from Lutao Island lack a lined pattern but possess a white-dotted pattern on the dorsum, which is unique in the genus *Eumeces*. Although this form is also distinct from most other East Asian forms in the scutellation, it overlaps the Taiwanese population of *E. chinensis* in several scale characters. Therefore, I describe the population from Lutao as a new subspecies of *E. chinensis* here. In the following descriptions, the terminology of head scales follows Taylor (1935). The number of paravertebrals is counted after Greer (1982).

Eumeces chinensis leucostictus subsp. nov.

Figs. 1–2

Eumeces chinensis chinensis (part): Okada, 1939, p. 168.

Holotype.—Osaka Museum of Natural History (OMNH) R 2811. A hatchling collected from Nanliao, Lutao (=Kashoto in old nomenclature) Island, Taitong Hsien, Taiwan by Hidetoshi Ota on 13 July, 1986 (Fig. 3).

Paratypes.—OMNH R 2812–2817, Taiwan Museum (TM) RL 0027–0029, Kyoto University, Zoology (KUZ) 7238, 7295–7299, 7303–7309, 8091–8092, 8107, same data as holotype.

Diagnosis.—This form differs from other subspecies in having a small white-spotted pattern on a black dorsum in juveniles and having the following characters; postnasal usually

present (63%); usually three pairs of nuchals (78%); two supraoculars in contact with frontal; mid-body scale rows, usually 26 (93%), rarely 24; paravertebrals 48–53 (median=50.6).

Description.—Snout rounded, portion of rostral visible from above triangular; supranasal moderately enlarged, but smaller than prefrontal; frontonasal large, in contact with anterior loreals and prefrontal; prefrontal smaller than frontoparietal, in contact with anterior and posterior loreals, first superciliary and first supraocular, longest suture with frontonasal; frontal moderate, much longer than its distance from tip of snout, slightly narrower posteriorly; frontoparietals longer than wide, forming a median suture equal to one-third of their length; interparietal slightly narrowed posteriorly, rounded behind, and in contact with nuchals; parietal large, greatest width about three fourths of length; nuchals usually 3 pairs (2/1 in 1, 2/2 in 5, 2/3 in 3, 3/2 in 2, 3/3 in 10 and 3/4 in 1, mean=2.6, mode=3, N=27);

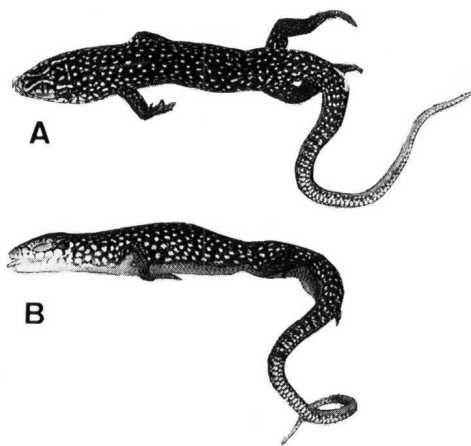


FIG. 1. Dorsal (A) and lateral (B) views of the holotype (OMNH R 2811) of *Eumeces chinensis leucostictus*.

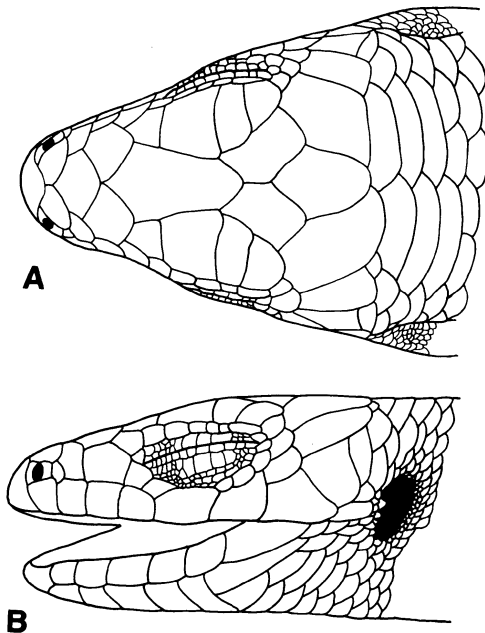


FIG. 2. Scutellation of head of *Eumeces chinensis leucostictus*. Dorsal (A) and lateral (B) views of head of the holotype (OMNH R 2811).

nasal moderate, divided, posterior part behind nostril as large as anterior part; postnasal usually present (1/1 in 15, 0/1 or 1/0 in 2, 0/0 in 10, $N=27$); anterior loreal higher than wide, slightly higher than posterior; posterior loreal three fourths as high as long, touching second and third supralabials; 2 presuboculars; 4 supraoculars, anterior 2 touching frontal in all specimens; superciliaries usually 8 (range=7–8, mean=7.5, mode=8, $N=27$); preocular small, followed by small scutes; 2 postoculars; 4 postsuboculars; primary temporal round in contact with two secondary temporals; lower secondary temporal large and fan-shaped; upper secondary temporal elongated with sides nearly parallel; tertiary temporals following secondary temporals; supralabials seven in all specimens, first slightly higher and larger than succeeding three, seventh much larger than sixth; lower eyelid with four large plates separated from presuboculars and postsuboculars by two rows of granules; postlabials following seventh supralabial, separating it from ear opening; one or two auricular lobules in anterior margin; mental enlarged with labial border much greater than rostral; usually 6 infralabials (6/6 in 23, 6/7 or 7/6 in 4); two postmentals; three pairs of chinshields; enlarged postgenial following third chinshield; inner edge of postgenial bordered

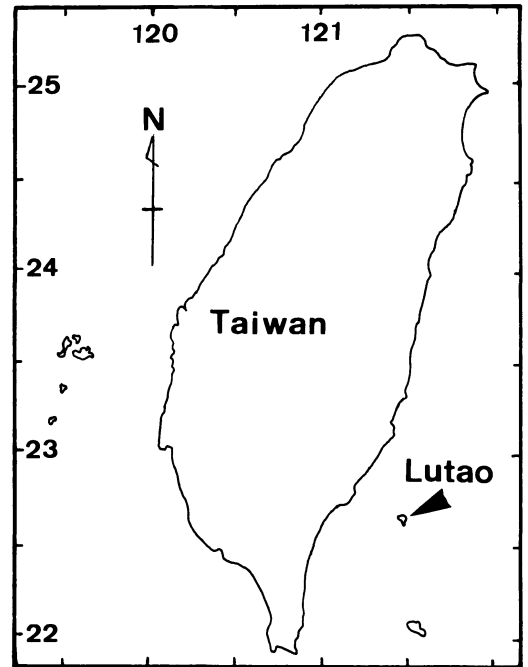


FIG. 3. Lutao Island, a locality of *Eumeces chinensis leucostictus*.

anteriorly by a scale longer than wide; body scales parallel on side of dorsum, dorsal scales of median row slightly larger than adjoining lateral scales; scale rows around middle of body usually 26 (26 in 25, 24 in 2, $N=27$); paravertebrals 50 (range=48–53, mean=50.6, $SD=1.45$, $N=27$); subcaudals strongly widened, 11 scale rows encircle tail at level of tenth subcaudal; no keeled scales in postanal region; a median pair of preanal scales very large, smaller outer scales overlapping inner; outer wrist tubercle prominent; no enlarged irregular scales on posterior femur; scales on outer side of sole flat, imbricated; fourth toe lamellae usually 16–17 (15/16 in 1, 16/16 in 8, 16/17 in 6, 16/? in 1, 17/16 in 6, 17/17 in 3, 17/? in 1, 18/17 in 1, $N=27$); intercalated series of digital scales only on basal phalanx.

Snout-vent length (SVL): 39.0–120.8 mm; tail length (as percentage of SVL): 133.3–156.5%, only for complete tails; axilla-groin length: 44.0–55.8%; head length: 15.0–22.6%; head width: 13.3–18.3%; forelimb length: 23.2–32.2%; hindlimb length: 30.6–42.6%. Younger lizards have relatively shorter body and longer limbs than older. Males have larger heads than females in adult.

Color in preservative.—In juvenile dorsum blackish, with white punctations somewhat

irregularly arranged in 16–18 rows, merging into lighter gray color of side of abdomen. A pair of short light lines along inner side of supraoculars. Immaculate cream below. Tail light blue above with white spots, lighter below. The juvenile pattern gradually fades during growth and is lost in full adult, though females retain this pattern longer than males.

Details of holotype.—A hatchling with SVL of 42.8 mm and intact tail of 62.1 mm; axilla-groin length 21.3 mm; head length 8.2 mm; head width 6.6 mm; forelimb length 12.1 mm; hindlimb length 17.8 mm; a pair of postnasals present; 6 infralabials; 7 superciliaries; 3 pair of nuchals; 17 fourth toe lamellae; 26 mid-body scale rows; 53 paravertebrals.

Etymology.—The name is derived from *leukos* (Greek), white, and *stiktos* (Greek), spotted, referring to the dorsal spotted pattern.

Remarks.—*E. c. leucostictus* is confined to Luta Island, Taiwan. Many individuals of this subspecies were observed in the grassland along the sea shore (Ota, personal communication).

DISCUSSION

The present form clearly belongs to the Asian members of the *obsoletus* group, since it is characterized by having a large body size (maximum of snout-vent length—120.8 mm), triangular lower secondary temporals, no femoral irregular scale patch, and no keeled scales in the postanal region. Four species of this group are known from East and Southeast Asia: *E. coreensis* from North Korea, *E. chinensis* from China including Taiwan, *E. kishinouyei* from the Ryukyu Archipelago and *E. tamdaoensis* from Northern Vietnam (Hikida and Darevsky, 1987). The most striking feature of *E. c. leucostictus* is that in juveniles the dorsal and lateral regions of the whole body, including the tail, are covered by minute white spots and not by light stripes. By this feature, this form is discriminated from *E. tamdaoensis* and *E. kishinouyei*. The latter two forms have light stripes on the dorsal and lateral regions of body. I have no information about juvenile color pattern in *E. coreensis*, since only three adults have hitherto been obtained (Doi and Kamita, 1937). The last species, *E. chinensis*, has three light stripes on the dorsum and minute spots on the flank. Further, additional indistinct rows of light punctations are found between the middle and dorsolateral light stripes in some young specimens of *E. chinensis* from Taiwan (Liang and Wang, 1975). If these lines are

interrupted, the dorsum becomes covered with irregular rows of punctations. The color pattern thus formed is the one in which small light spots cover whole dorsum. Possibly a white dotted dorsum of *E. c. leucostictus* is derived from color pattern of *E. chinensis*.

Eumeces c. leucostictus differs from *E. tamdaoensis* in the larger number of paravertebrals (50–53 in contrast to 38–40 of *E. tamdaoensis*: Bourret, 1937; Hikida and Darevsky, 1987). It differs from *E. kishinouyei* in the larger number of mid-body scale rows and the smaller number of supraoculars in contact with the frontal: *E. c. leucostictus* has usually 26 (93%) and rarely 24 (7%) mid-body scale rows and usually two supraoculars contact with frontal, while *E. kishinouyei* has 24–26 (24: 70%, 25: 12%, 26: 18%, N=50) mid-body scale rows and usually three supraoculars in contact with the frontal (Hikida, unpublished data). In addition, Taylor (1935) stated that a huge size was a distinct feature of *E. kishinouyei*. The largest individual of *E. kishinouyei* I have examined was 176.0 mm in SVL, while the largest individuals of *E. c. chinensis* and the present new form are much smaller, 128.8 mm and 120.8 mm in SVL, respectively.

Doi and Kamita (1937) described *E. coreensis* as a distinct species based on only three specimens, since it differed from *E. chinensis* in having a single and not two postmentals and 6 and not 7, supralabials. Of these two 'distinguishing' characters, the first one is probably based on a misidentification. Taylor (1935) reported the occurrence of a vertical division in the second postmental in *E. chinensis*. Probably the first of the four pairs of chinshields, reported by Doi and Kamita (1937) was the divided second postmental. The second feature is not specific to *E. coreensis*, but is also found in *E. chinensis*. A northern subspecies, *E. c. pulcher* is characterized with six supralabials (Taylor, 1935). Thus, the Korean form should be included in the species *E. chinensis* and may be treated as a subspecies, *E. c. coreensis*, or as a synonym of *E. c. pulcher*.

Eumeces chinensis occupies a wide range and shows a marked geographical variation in scutellation. Four subspecies have hitherto been named: *E. c. chinensis* from southern China, *E. c. pulcher* from northern China, *E. c. formosensis* from Taiwan, and *E. c. daishanensis* from small islands of Zhejiang (=Chekiang) Province. The taxonomic relationships among these four named forms are very poorly understood. Therefore, it may be

pertinent to compare *E. c. leucostictus* with each of these forms regardless of their taxonomic validity.

Eumeces c. leucostictus has usually 26 mid-body scale rows (93%). Although *E. c. daishanensis* was reported to have 26 mid-body scale rows (Mao, 1983), other subspecies possess usually 24 and rarely 26 rows. The specimens with 26 rows account for 7% (n=200) of the Fukien population of *E. c. chinensis* (Schmidt, 1927; Pope, 1929), 18% (n=11) of *E. c. pulcher* (Taylor, 1935) and 22% (N=50) in *E. c. formosensis* (Hikida, unpublished data). Consequently, the 26 mid-body scale rows usually found in *E. c. leucostictus* are a unique feature when compared with most populations of *E. chinensis*, although the range of variations slightly overlaps.

Eumeces c. leucostictus usually possesses a postnasal (63%). The continental forms of *E. chinensis* usually lack a postnasal and only rarely possess one: the occurrence of the postnasal is 0% (N=27) in *E. c. daishanensis*, only 9% (N=11) in *E. c. pulcher*, and 6% (N=200) in the Fukien population of *E. c. chinensis* (Schmidt, 1927; Pope, 1929; Mao, 1983). On the other hand, *E. c. formosensis* was first reported to have a postnasal. I found the postnasal absent in *E. c. formosensis*, but the frequency of the absence is much lower (presence of the postnasal=29%, N=48; Hikida, unpublished data). In respect to the frequent presence of the postnasal, *E. c. leucostictus* is similar to *E. c. formosensis*, and is remote from the continental forms.

As discussed above, *E. c. leucostictus* most closely resembles *E. c. formosensis* in the scutellation and is probably derived from the latter form through geographic isolation.

SPECIMENS EXAMINED

Eumeces tamdaoensis, Northern Vietnam: Muséum National d'Histoire Naturelle, Paris (MHNP) 1948.65, Zoological Institute of Leningrad (ZIL) 19806; *Eumeces chinensis*, Taiwan: National Science Museum, Tokyo (NSMT) 2377–2378, 02455, National Taiwan University (NTUM) 467, 483–493, 495–496, 498–499, 501–506, 508–509, 512–515, 517, 02962, 1 unnumbered specimen, Hikida's personal collection 14 specimens; *Eumeces kishinouyei*, Ryukyu Archipelago: NSMT 02379, 02393; Sengoku's personal collection 2 specimens; Toyama's personal collection 44 specimens; Hikida's personal collection 2 specimens; *Eumeces chinensis leucostictus*, Lutao: Toyama's Collection 1 specimen.

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要旨 台湾省緑島からチュウゴクトカゲの新亜種

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台湾の東方に位置する緑島からチュウゴクトカゲの新亜種, *Eumeces chinensis leucostictus* が記載された。この亜種は, 幼体背面の独自の

白斑模様と, いくつかの計数形質の組合せで, 他の亜種と区別される。
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